

FEDERATED MALAY STATES.

REPORT ON FOREST ADMINISTRATION FOR THE YEAR 1913.

PART I.

CONSTITUTION OF RESERVED FORESTS.

I.—ALTERATION OF AREA.

(For details, see Form I.)

1. Twenty additional reserves, or extensions of existing reserves, were finally gazetted under section 12 of the Forest Enactment during the year under report, the net addition to the reserved area being 151,415 acres, or about 236.6 square miles, bringing the total area of finally constituted reserved forests of the Federated Malay States to 1,447.3 square miles, or about 5.2 per cent. of the total area; to this may be added, for practical purposes, the area (25.5 square miles) of the Bruas reserve in Perak which was revoked during the year for the purpose of regazetting after survey. This brings the total area of reserves to 1,472.7 square miles, or 5.28 per cent.

The total number of forest reserves is now 87. Their areas are shown in form I attached to this report. The following table shows the area in each State (in square miles):

State.	Area of State.	Area of reserved forests.			Percentage of reserves.
		On 31st December, 1912.	Net increase or decrease.	On 31st December, 1913.	
Perak	7,800	462.8	— 12.1	450.7	5.78
Selangor	3,200	337.0	+ 45.0	382.0	11.94
Negri Sembilan	2,550	237.5	+ 32.3	269.8	10.58
Pahang	14,300	173.4	+171.4	344.8	2.41
Total	27,850	1,210.7	+236.6	1,447.3	5.20

2. The only new reserve constituted in Perak was the Rungkup mangrove forest, which is situated on the Coast between the Perak and Bernam rivers. The apparent reduction in the total area of reserves in the State is due to the revocation of the Bruas reserve as explained in paragraph 1. Several large tracts of forest, which had been preliminarily notified during 1912, could not be settled during 1913, and still remain as proposed forest reserves. The fact that the proportion of forest reserves in Perak is so much lower than those of Selangor and Negri Sembilan is explained by the fact that there is in that State a larger proportion of undeveloped and inaccessible country. In Selangor and Negri Sembilan forest reservation on the plains is now nearly complete. Further reservation will be necessary on the hills in order to protect the water-courses. This regulation of the drainage of the country is the most important object of the perpetual preservation of forests in the Federated Malay States. With an annual rainfall of from 70 inches on the Coast to 280 inches in the hills the destruction of the forests at the river sources must result in the rapid erosion of hillsides, the silting up of streams, increased floods in the low country after heavy rain, and a diminution of the underground water supply during times of drought.

3. In Selangor, two water catchment areas were taken over by the department, and gazetted as forest reserves; one of these supplies the water of Kuala Lumpur, and is 7,170 acres in area. It is situated at Ampang, and owing to its proximity to several mines requires constant patrolling. The Bukit Sungei Puteh reserve, also near Kuala Lumpur, lies on a ridge, which has been almost entirely denuded of forest growth by miners, and will require many years of protection before it is again covered with forest. The Kelambu, Bukit Belata extension, and Bukit Enggang reserves were all made with a view to future timber supplies.

4. In Negri Sembilan, extensions were made to seven existing reserves, all with a view to timber production.

5. The new reserves in Pahang consisted of one small extension to an existing reserve, two water catchment areas, 223 acres of mangrove forest at Baloh, and 108,700 acres of magnificent camphor-wood forest on the Rumpin river.

The percentage reserved—2.41 per cent.—is still very small, but the unreserved forests of Pahang are not in immediate danger from over-exploitation.

6. The only large revocation of previously existing reserves was that of the Bruas reserve in Perak; and this forest has since been regazetted. One hundred and sixty-three acres of the Rantau Panjang reserve were excluded for the benefit of the Rawang Colliery Company. Several small increases and decreases in areas, which appear in form 1, are due to corrections in the computations of areas of reserves as the result of survey. The areas given formerly were computed on demarcation.

II.—RESERVE PROPOSALS AND SETTLEMENTS.

(For details, *see* Form 2.)

7. At the end of the year there were 19 reserves, or extensions to existing reserves, preliminarily notified under section 4 of "The Forest Enactment, 1907," and awaiting settlement, with an aggregate area of about 250,131 acres.

8. Six new reserves were proposed in Perak, aggregating 49,735 acres; one of these, the Rungkup mangrove forest in Lower Perak, was finally gazetted before the end of the year. The object of this reserve is to maintain a permanent supply of timber and fuel for domestic purposes for the local Malays and the Chinese fishing population at the mouth of the Bernam river. This is particularly necessary as all land on the Perak side of the river has been alienated for agricultural purposes. The other proposals were: the extension of Tanjong Toalang reserve, the Bruas reserve, and two reserves in Upper Perak, for timber and for the protection of the water supply of the bendang-land below them. At the request of the Perak Government the Chior Big Game reserve was preliminarily gazetted under the Forest Enactment, with a view to reservation in order to give it additional protection against the wood-cutting privileges of miners. The very important Sayong reserve, which forms an extension of the Kledang reserve, and will include the whole range of hills to the west of the Kinta valley, was not settled at the end of the year, although most of the demarcation had been completed. This area must be again preliminarily gazetted, as the original scheme has been further extended. The Ulu Piah proposal was revoked in its original form to be regazetted later with an increased area. The surveys of the Ijok and Kuala Kurau mangrove area were not completed by the end of the year.

An extension of the Berang forest reserve, and about 10,000 acres of forest in Lower Perak were partially explored during the year with the object of reservation later.

9. In Selangor, ten new reserves were preliminarily gazetted, of which one, the Kelambu timber area in the Jugra district, was finally gazetted. Two are small water catchment areas, and one is to protect the ridge between the Kuala Lumpur and Kajang districts, which has been almost stripped of all cover by miners. Timber reserves, covering about 13,080 acres, were proposed at Gunong Hitam (an extension), Bukit Badong, Semangko Gap, and Kanching (an old reserve to be regazetted). Mangrove forests amounting to 13,500 acres were also proposed, of which 10,000 acres are in the Klang district. This forest is easy of access by sea, railway and road, and it should prove very valuable in the future.

The exploration of several other mangrove areas was proceeded with, and the demarcation of the suggested Bukit Tarek reserve in the Ulu Selangor district was undertaken but not completed.

10. In Negri Sembilan, the Labu and Sendayan reserves were extended by 4,550 and 1,240 acres respectively, and both extensions were finally gazetted.

The forests at Bahau and Muar-Palong were explored and reports were received, but no definite proposal has yet been formulated.

11. In Pahang, three new reserves were proposed and all finally gazetted before the end of the year. They were, a small mangrove forest at Baloh, a small area at Kuala Rumpin (containing trees numbered for annual measurement), and the forest of camphor-wood at Gunong Lesong, between the Endau and Rumpin rivers.

According to reports which have been received this latter reserve is of very great value. The camphor tree (*Dryobalanops camphora*) occurs over a large part of the area (108,700 acres) in almost pure stands. The timber is that commonly known as Borneo camphor-wood, and is of high quality for general purposes.

The timber forests at Bukit Woh were explored and demarcated, and those at Butki Serudom were explored but the demarcation could not be completed before the rainy season put an end to field work in the Kuantan district.

12. Altogether the work of exploration was well carried on in all States except in Perak, where the time of all the officers who could be spared from the collection of revenue was fully occupied on the proposed Sayong reserve.

PROTECTIVE FOREST BELTS.

13. The system of agricultural protective belts in Selangor and Negri Sembilan was completed and approved by the Chief Secretary, and that in Perak was completed in all but a few minor points. The belts are marked on the Land Office plans and are under the charge of the District Officers.

ALIENATED LAND.

14. The total area of alienated land in the Federated Malay States at the end of the years 1912 and 1913 is given as follows :

	1912. Acres.	1913. Acres.
Perak	796,800	883,200
Selangor	553,438	589,123
Negri Sembilan	371,031	390,462
Pahang	185,296	262,571
Total ...	1,906,565	2,125,356

At the end of the year there were therefore 3,321 square miles of alienated land, or 12 per cent. of the whole Federated Malay States.

15. Practically all land which is not alienated is under forest. The following statement shows the proportions of State land, alienated land, reserved and unprotected forests (in square miles) :

State.	Areas in square miles.			
	State.	Reserved forests.	Alienated land.	Unprotected forests.
Perak	7,800	450	1,380	5,970
Selangor	3,200	382	920	1,897
Negri Sembilan	2,550	270	610	1,670
Pahang	14,300	345	410	13,545
Total ...	27,850	1,447	3,321	23,082
Proportion to total area ...	100 %	5.20 %	11.9 %	82.9 %

III.—DEMARCATIION AND UPKEEP OF BOUNDARIES OF RESERVED FORESTS.

(For details, see Form 3.)

16. One hundred and forty miles of new boundaries of reserved forests were cut and demarcated during the year, and 1,046 miles of existing boundaries were re-cleared at a cost of \$6,840, or of \$6.54 per mile.

17. The cost of upkeep per mile in each State was :

Perak	\$4.35
Selangor	7.81
Negri Sembilan	7.30
Pahang	7.97

There is a satisfactory general reduction in the cost of maintenance of boundaries as compared with former years. In many districts the cost might be further reduced by the abolition of contracts, and the employment of the departmental subordinate staff to supervise the work.

18. The length of boundaries requiring no demarcation—i.e., boundaries composed of railways, roads, streams, or other natural features, was 749 miles. The length of artificial boundaries which did not require repairs was 106 miles, bringing the total length of all boundaries of reserved forests to 2,041 miles.

IV.—SURVEYS.

(For details, *see* Form 4.)(a)—*By the Survey Department.*

19. The total area dealt with and completed by the Survey Department was 121,689 acres. Good progress was made in Negri Sembilan and Pahang.

20. In Perak the surveys of the Gunong Besaut and Kurau reserves were completed, comprising a total of 6,919 acres. An area of 781 acres was excised from the mainland mangrove reserve for the purpose of conversion into "bendangs." The Ijok reserve survey was nearly completed at the end of the year.

21. In Selangor, Bukit Enggang, Bukit Badong and Bukit Sungai Puteh, containing 8,893 acres, were surveyed. One hundred and sixty-three acres were excised from the Rantau Panjang reserve for the benefit of the Rawang Colliery Company.

22. In Negri Sembilan, 81,135 acres were surveyed, including the Pasoh, Senaling-Inas, and Sungai Menyala reserves.

23. Four reserves were surveyed in Pahang, amounting to 23,798 acres. This area includes the large Bukit Goh timber reserve, the mangrove reserve, Kuantan, and the Jahit and Sungai Mangsok reserves.

(b)—*Rough Survey by Forest Officers.*

24. In Perak, 220 miles of prismatic compass traverse were made by the Forest Department, at a cost of \$28.78 per mile as against \$23 in 1912. This includes the demarcation of new boundaries, and the survey of the new paths, compartment-lines and interior details of reserves.

25. In Selangor, 67 miles of interior surveys of reserves were made, chiefly by Malay demarcators under the supervision of the District Forest Officers. The cost was \$7.91 per mile.

26. In Negri Sembilan, 69 miles of paths, compartment-lines, etc., were roughly surveyed by Forest Officers, at a cost of \$26.10 per mile.

27. In Pahang, two demarcators were employed throughout the year partly on the boundaries of new reserves and partly on the interior details of old ones. They surveyed an area of 40,000 acres and 28 miles of traverse.

28. An arrangement was made with the Technical Instructor whereby a limited number of subordinate Forest Officers were taught elementary surveying. Two Malays from Selangor were so trained at the Treacher Technical School, and at the end of the year a Forest Ranger, Grade I, and a Malay Forester from Pahang attended the school. Other officers will follow as they can be spared from their usual duties. A subordinate staff capable of doing easy surveys will be of great value to the department; at present the District Forest Officer is usually the only officer who can survey interior details of the reserves. The mapping of forest reserves is a matter which requires to be pushed on rapidly. Without maps it is impossible to regulate and supervise efficiently either exploitation or sylvicultural works.

PART II.

MANAGEMENT OF FORESTS.

I.—WORKING PLANS.

29. The total area of mangrove forests under working plans at the end of the year was 128,216 acres.

The coupes leased and worked are shown in appendix A.

30. In Perak, 3,468 acres of forest were leased, but no offers were made for the coupe on Trong Island. The average price paid was \$5.68 per acre as against \$4.74 in 1912, and \$3.97 in 1911. Coupe 6 of 1911, Trong Island, was not worked out in 1912, and the lease was extended throughout the year at the old rates; the revenue received was \$3,000 for the year. Extensions were also granted to work half the 1912 coupe on Sangga Island and 100 acres of that in the Central Working Circle. The Deputy Conservator of Forests reports that the work has improved, and that the workmen are more careful than formerly. Fines amounted to \$376 as against \$924 in 1912.

31. In Selangor, 1,123 acres on Klang Island were, as usual, set apart for the firewood contractor to the Federated Malay States Railways. The revenue realized was \$17,086 or \$15.30 per acre. Most of the forest on the area was utilized and the workmen were, on the whole, careful. Only \$110 were collected in fines. An extension of six months, in order to work out the 1912 coupe, was granted to the same contractor. The revenue realized was \$619, bringing the total revenue from this reserve for the year to \$17,705.

Five coupes of 100 acres each were tendered for and leased on Jugra Island. The revenue realized was \$5,181 or \$10.36 per acre. The Deputy Conservator of Forests reports that the work was not good as the actual lessees never go over the coupes themselves but leave everything in the hands of their kepalas. Two hundred and eighty-five dollars were collected in fines.

The experiment was tried at Banjar of leasing a coupe of 61 acres of mangrove forest on which everything might be cut without any size limit except 60 trees marked as seed-bearers. The revenue realized amounted to \$78 only, and, as an experiment, the scheme taught us nothing since the forest was hardly touched. The area was leased to two Malays who made only feeble efforts to exploit the forest.

32. The usual coupe of 80 acres was leased in Sepang reserve. The revenue realized was \$385 or \$4.57 per acre.

33. The Kuantan coupe of 70 acres was leased to the Public Works Department firewood contractor for the supply of the dredger. The supply was not nearly sufficient, and much additional firewood had to be obtained from other forests. The revenue amounted to \$568 or \$8.11 per acre.

34. The areas set apart for fishing stakes in Perak were sufficient and supplied 102,801 stakes; royalty amounting to \$1,077 was realized on 82,901 of them, while 19,900 were supplied free of royalty to Malays.

35. No other forests were worked under settled working plans, but countings were made in the areas of improvement fellings in several reserves with the following results:

State.	Name of reserve.	Area, acres.	Number of first class trees, over three feet in girth, per acre.
Perak ...	Parit ...	522	17.0
Selangor ...	Bangi ...	2,203	9.5
	Senawang ...	147	8.4
	Senaling Inas ...	283	26.3
Negri Sembilan ...	Kopis ...	204	14.7
	Serting ...	78	9.9
	Pasoh ...	344	8.1
Pahang ...	Bukit Goh ...	493	17.3
	Baloh ...	236	16.3

The number of smaller first class trees was everywhere very great. In Pahang, on 2,270 acres in which improvement fellings were made, 318,449 first class trees of all sizes were counted, an average of over 140 per acre.

36. An important step towards the organized working of the reserves is the laying out of an adequate system of compartments. This has been completed in some reserves, but much still remains to be done. The compartments are usually about 200 acres in extent and they form the area units of working, both as regards improvement fellings and exploitation. Each compartment is numbered and their boundary lines are used as paths for inspection purposes.

37. The girth measurements of selected trees were made as usual:

Species.	Perak.	Selangor.	Negri Sembilan.	Pahang.	Total.
Bakau ...	100	90	...	...	190
Balau ...	...	...	...	30	30
Bintangor ...	...	20	27	...	47
Chengal ...	45	...	16	98	159
Getah taban ...	347	40	69	38	494
Giam ...	...	...	...	30	30
Jelutong ...	...	19	10	...	29
Kelat ...	29	...	10	...	39
Kapur baru ...	...	39	...	30	69
KerANJI ...	...	...	10	...	10
Kumus ...	...	...	19	...	19
Meranti ...	30	56	30	38	154
Merbau ...	...	133	10	68	211
Keruing ...	...	...	20	...	20
Nyato ...	...	...	10	...	10
Penaga ...	...	23	...	...	23
Petaling ...	30	...	29	20	79
Rengas ...	...	...	2	...	2
Resak ...	...	...	20	...	20
Ru ...	...	25	...	...	25
Teak (Jati) ...	...	20	...	...	20
Tembusu ...	...	20	...	...	20
Total ...	581	485	282	352	1,700

A few trees were discarded owing to abnormalities in their growth, and many new ones were marked for future measurement.

38. The annual girth increment was on the whole satisfactory. The records in this office do not yet cover a sufficiently long period to warrant a reliable calculation being made as to the age of most profitable exploitation of all species, but a rough estimate can be made in the case of two of the most valuable.

(A).—*Chengal* (*Balanocarpus maximus*). From annually recorded measurements of trees in Bilut, Baloh, Bukit Goh, Pondok Tanjong, and Senaling Inas forest reserves.

—	Class IV, under 3'.	Class III, 3'-4' 6".	Class II, 4' 6"-6'.	Class I, 6'-7'.
Number of annual increments recorded	256	93	86	48
Sum of annual increments ...	190.75"	95.50"	79.50"	46.50"
Average annual increment ...	.745"	1.026"	.923"	.968"
Calculated life in class ...	48 years	18 years	20 years	13 years

The calculated age at which a chengal tree attains a girth of seven feet at a height of six feet from the ground is, therefore, about 100 years.

(B).—*Getah taban*. From annually recorded measurements of trees in Taiping (Waterfall), Trolak, Senawang and Sungei Kerpan forest reserves.

—	Class III, under 3'.	Class II, 3'-4' 6".	Class I, 4' 6"-6'.
Number of annual increments recorded	1,554	414	110
Sum of annual increments ...	2,802.50"	908.00"	189.50"
Average annual increment ...	1.803"	3.193"	1.592"
Calculated life in class ...	20 years	8 years	11 years

The calculated age at which a getah taban tree reaches a girth of six feet is, therefore, about 40 years.

The results here shown should not be accepted as a final statement of the question of the rates of growth of the two species. A longer period is required for the collection of data from which reliable conclusions may be drawn. In the meantime the results given above are of interest as giving an approximate idea of the ages of trees of various sizes.

PLAN OF OPERATIONS.

39. In Perak there were some small variations from the sanctioned plan. All the old paths in reserves were upkept, but the new work was $2\frac{1}{2}$ miles short of the total laid down in the plan of operations. There was a saving of \$227 on the vote.

Under the head of regular plantations, 34 acres of taban plantation were made at Trolak instead of 40 acres. The plantation of rotan sega at Pondok Tanjong was not made, as the seedlings were not large enough to transplant. The area of improvement fellings was short by 376 acres of new work and by 442 acres of old work. There was a saving of \$823 on the vote.

The reason given for failure to carry out the whole work is that labour was very difficult to obtain in the Batang Padang district, where most of the work lay.

40. The plan was carried out as sanctioned in Selangor with the exception that an extra $4\frac{1}{2}$ miles of path were made, and that the improvement fellings in Ulu Selangor cost considerably more per acre than was estimated, and were of less extent than was expected.

41. In Negri Sembilan the area of improvement fellings was short by 132 acres. Twenty-one and a half miles of paths were constructed instead of 13 miles, and there was a saving of \$196.

42. In Pahang the plan was carried out in full except in the Coast district. The work on the Rumpin river was not completed owing to lack of labour. The principal shortages were two miles of path in Baloh reserve and 280 acres of improvement fellings in Gunong Lesong reserve.

II.—COMMUNICATION AND BUILDINGS.

... (For details, see Form 6.)

43. Eighty-four miles of new paths were made at a cost of \$3,787, or \$45.08 per mile. Two hundred and thirty-four miles of old paths were upkept at a cost of \$1,667, or \$7.12 per mile.

The following table shows details for each State :

State.	New paths.			Upkeep of paths.		
	Length, miles.	Cost.	Cost per mile.	Length, miles.	Cost.	Cost per mile.
		\$	\$ c.		\$	\$ c.
Perak	23	1,057	45 95	88	328	3 72
Selangor	28	1,700	60 71	40	295	7 37
Negri Sembilan	21	804	38 28	49	680	13 87
Pahang	12	226	18 83	57	364	6 38
Total ...	84	3,787	45 08	234	1,667	7 12

The total length of paths made by the department up to the end of the year was 337 miles; this does not include many miles of old paths which existed as jungle-tracks, game-tracks, or timber dragging-paths before reservation and which are now kept clear by the forest staff.

44. New checking stations were built at Lenggong (Perak); Kuchai, Rawang, Kuala Kubu, Serendah, Kuala Klang, Cheras, Bukit Tunggul (Selangor); Serting, Pertang, Pasir Panjang and Titi (Negri Sembilan). Many of these were to replace old stations.

In some cases the Forest Guards who patrol the reserves are quartered in checking stations, but special quarters for such guards were erected at Parit, Bagan Datoh (Perak), Temerloh, and Tembeling (Pahang). Quarters for a Malay Ranger and for a Forester were erected at Pudu (Selangor). Quarters for boatmen were built at Port Swettenham, and a boat-house at Pasir Itam (Perak).

Halting bungalows were built at Bukit Belata and Bukit Sungei Puteh in Selangor, and at Kuala Rumpin and Baloh in Pahang, for the use of senior officers when on tour.

III.—PROTECTION AND BREACHES OF FOREST LAW.

LEGAL.

45. The following amendments of the rules were made during the year :

Forest Rules, 1909. Schedule I.

Gazette Notification No. 23.—

Royalty on damar penak (chengal) Nos. 1 and 2 qualities, per pikul, \$1
 " " " No. 3 quality, per pikul, 20 cents

Gazette Notification No. 157.—

Royalty on taban leaves, per pikul, 20 cents.

Gazette Notification No. 2717.—

Kajang was added to the list of places where royalty might be collected on kandar loads of firewood. (*Forest Rules, 1909. Schedule III.*)

FOREST OFFENCES.

(For details, see Form 7.)

46. Eight hundred and thirty-two cases were dealt with, 692 by the Courts and 140 compounded by the Deputy Conservators of Forests, as compared with 443 cases in Courts and 69 compounded in 1912, and with 544 and 39 in 1911.

In the 692 Court cases there were 591 convictions and 55 acquittals, and in 46 cases the defendant was discharged with a caution.

Year.	Percentages.		
	Convictions.	Cautioned.	Acquitted.
1912	85 per cent.	8 per cent.	7 per cent.
1913	85 ..	7 ..	8 ..

The increase in the number of prosecutions was general throughout the States.

47. Convictions, including those in which defendants were cautioned, in the four States, together with the sum of the fines inflicted and the average fine are shown in the following table:

State.	Convictions.		Fines.		Average fine.	
	1912.	1913.	1912.	1913.	1912.	1913.
			\$	\$	\$	\$ c.
Perak	91	90	3,576	7,970	19	24 37
Selangor	90	94	1,095	2,679	15	19 99
Negri Sembilan	97	93	1,128	1,643	30	46 00
Pahang	94	95	435	1,548	5	14 33
Total ...	93	92	6,234	13,840	16	23 42

Unclaimed and confiscated property amounted to \$4,700 as compared with \$6,223 in 1912.

48. The Deputy Conservators of Forests compounded cases as follows:

State.	Number of cases.		Compensation.	
	1912.	1913.	1912.	1913.
			\$	\$
Perak	3	37	10	804
Selangor	36	10	341	181
Negri Sembilan	30	75	382	1,013
Pahang ... ..	...	18	...	406
Total ...	69	140	733	2,404

49. In Perak there was one serious case of encroachment on Kledang reserve, where a water-course for a mine was cut for some considerable way into the reserve.

The protection of the Ampang catchment area has greatly increased the work of the Kuala Lumpur forest staff, but as the penalties inflicted by the Magistrates have steadily increased in severity, the number of cases decreased towards the end of the year.

In Pahang the fines inflicted by the Magistrates for the felling of unmarked trees gradually increased from \$20 to \$150, with the result that this offence is now less common. The sleeper contractors to the Railway Department were the principal offenders. A warrant against one of the getah taban raiders of 1910 was successfully executed, and the accused was sentenced to six months' imprisonment.

50. The work of the patrolling staff is everywhere well reported on.

IV.—SYLVICULTURE.

(a)—*Natural Reproduction.*

51. The year 1913 was on the whole, like 1912, a bad seed year. Chengal fruit is reported from Kinta and Lower Perak. Elsewhere there was very little.

Merbau fruited well in the Lipis district. Camphor flowered in Kanching, but little seed is reported. Taban, betis, and kulim fruited in Ulu Selangor.

52. In every State the Deputy Conservators of Forests report that trees of the valuable species, and particularly meranti, have reproduced themselves profusely in the areas over which improvement fellings have been made.

(b)—*Works of Improvement.*

53. During the year 1913, 11,699 acres of improvement fellings in favour of getah taban and hardwood trees were made as against 10,752 acres in 1912 and 9,998 acres in 1911. The cost was \$23,646, inclusive of cooly lines, tools, transport, etc. Of this area, 7,360 acres were new work, while 4,339 acres had been treated previously once or oftener.

54. The total area in the Federated Malay States which has now been treated is 36,169 acres, distributed as follows:

	Acres.
Perak	13,495
Selangor	11,669
Negri Sembilan	1,783
Pahang	9,222

The discrepancy between this figure and that given in the annual report for 1912 is due to the fact that several areas were over-estimated, and that these have since been surveyed and the areas corrected. Work was carried on in 29 reserves. Full particulars are given in form 8.

55. The cost is given in various forms in the different States, but, on the whole, the work has been done cheaply. In the Coast district of Pahang, where the work is done mainly by Sakais, and is very cheap, the enumeration of the trees has been discontinued to a great extent, because the Sakais could not be relied on to keep a tally.

Some of the figures of the cost per acre are:

Perak	{ First felling	\$2.90
	{ Second „	1.44
	{ All work	2.10
Selangor	„ „	2.20
Negri Sembilan	„ „	2.85
Pahang ... ..	„ „ ... ..	.99

The above figures include all charges, such as cost of buildings, tools, etc.

The good results of this method of improvement fellings are already beyond doubt. Its value in the gutta-percha (taban) forests of Trolak and Rantau Panjang was evident several years ago. There are now in those forests some areas of pure taban, all other species having been gradually eliminated. Originally taban probably formed nowhere more than 10 per cent. of the forest, and generally the proportion was considerably less. The system has been applied for a shorter time with a view to the production of timber; the effects therefore are not yet so apparent, but there is little doubt that the same satisfactory results will follow, and in course of time we may expect to bring some of the forest reserves to a condition in which almost every tree will be of value as timber. That the value of such a forest would be very great is obvious.

(c)—Artificial Reproduction.

REGULAR PLANTATIONS.

(For details, see Form 8.)

56. The Para rubber plantations at Pondok Tanjong and Kuala Tembeling, 283 and 176 acres in area respectively, were transferred to the charge of the Director of Agriculture on 1st January, 1913, and are no longer shown in the forms attached to this report. Forty-six thousand eight hundred and fourteen dollars were credited to revenue as receipts from Pondok Tanjong from rubber despatched to England for sale during 1912.

57. One hundred and sixty and a half acres were added to the area of plantations during the year under report. Four hundred and fifty-nine acres were handed over to the Agricultural Department, and some small alterations having been made (due to corrections of area on survey), the total area of plantations under the care of this department at the close of the year was 594 acres.

The newly planted areas were as follows:

	Acres.
Mangrove	120
Getah taban	34
Teak	6½

58. The following table shows the distribution and character of the existing plantations:

Species.	Perak.	Selangor.	Pahang.	Total.
Para rubber	52	14	7	73
Chengal and Para rubber ... ..	...	6	...	6
Casuarina, Tembusu, Gelam, Malabira } and Para on old mining land }	55½	215	...	270½
Getah taban	42	...	...	42
Teak ... ..	...	6½	...	6½
Merbau ... ..	...	...	4	4
Mangrove	163	29	...	192
Total	312½	270½	11	594

The cost of the making and upkeep of the plantations was \$10,586 and the gross receipts \$58,401.

59. The 52-acre plantation at Taiping produced 9,735 lbs. of rubber as compared with 7,462 lbs. in 1912. Two thousand two hundred trees were tapped, with an average yield of 4.42 lbs. per tree. The total receipts amounted to \$10,850, of which \$4,434 were on account of rubber collected in 1912. The sale of stumps realized \$42.

60. The total cost of production, exclusive of the new quarters for the mandor (\$650), and of the expenses of the treatment of an attack of "die-back," were 8.6*d.* per lb. as against 9*d.* in 1912.

OTHER PLANTATIONS.

61. *Mangrove*.—Fifty-one acres were planted at Kuala Kurau at a cost of \$214, and 40 acres at Pasir Itam (by the forest staff) for \$17. Both these areas suffered from the attacks of crabs and monkeys, but as the planting was close—4' × 4'—there is room for some failures. Twenty-nine acres were planted with mangrove on Klang Island at a cost of \$204.

62. *Teak*.—Six and a half acres were sown at Sungei Buloh. The seed was obtained from Burma, and great trouble was taken both in Burma and in this country to keep it in good condition. Half the seed was scorched before sowing, a method which has been adopted with success elsewhere, but in spite of all precautions the percentage of seed that germinated was small. Some of the same seed was sown at Baloh, in the Kuantan district, with the same result, although a small nursery at the Forest Officer's house at Kuantan did fairly well. All experiments with teak have hitherto been disappointing. They will, however, be continued on a small scale. As far as is known teak, which is a deciduous tree, has only succeeded in countries which have distinct seasons, a condition which does not obtain in the Federated Malay States.

63. *Gutta-percha*.—Thirty-four acres of forest land at Trolak were felled and burned; eight acres were sown with taban (*Palaquium* sp.) seed and the rest planted with seedlings and stumps. The procuring of seed has always been the great difficulty in the cultivation of gutta-percha. The trees fruit freely but the fruit is very attractive to birds, bats, and squirrels, and in consequence the seed is found under the trees in small quantities only, the whole fruits being carried away from the parent trees. The seed planted at Trolak was obtained from Penang and Pulau Jerejak. The object of the plantation is to produce gutta by extraction from the leaves of taban, a process which is now recognized as the most important, and possibly the only means of maintaining the gutta supply of the future. For this purpose only the leaves of *Palaquium oblongifolium* can be utilized. Other *Palaquium* species, which are useless for the purpose of extraction from the leaf, commonly occur in forests together with *Palaquium oblongifolium*, and it is very probable that hybrids are produced. Hybrids cannot be detected in the seed, but fortunately *Palaquium oblongifolium* is easily recognizable from the leaf or from an examination of the gutta that exudes on the leaf being torn. Hybrids can thus be detected directly they germinate.

UPKEEP OF PLANTATIONS.

ABANDONED MINING LAND.

64. (a) *Taiping*.—The area at Asam Kumbang was upkept but no further planting was done.

(b) *Serendah*.—The northern block has been almost entirely swamped by the rise of the Serendah river, and no money was spent on it on this account. The southern block was upkept.

(c) *Circular Road*.—The plantations were upkept, and some small plantings were made in bare areas. The rubber was expensive as the swampy soil grows weeds very rapidly. The experimental nursery was upkept. Artificial re-forestation of worked-out mining land has proved a very expensive undertaking, and has only succeeded in a small degree. It is probable that the ordinary processes of nature will eventually do all that is required. After the land has been abandoned by miners for some years, lalang or small weeds occur; these in course of time give place to a stronger growth comprising such plants as Letop (*Passiflora foetida*), Tahi ayam (*Lantana*) and Sendudok (*Melastoma polyanthum*) which in their turn improve the soil and attract birds: the latter bring in the seeds of trees, and the foundations of a future forest are thus laid.

65. The old teak sowing at Sungei Buloh was kept in good order. Some of the trees have grown exceedingly well.

66. An attempt to check the erosion of the foreshore at Telok Sisek, near Kuantan, by planting mangrove has hitherto met with little success. Experiments with other species are being carried out.

NURSERIES.

67. No new nurseries were made in Perak, and that at Bikam was abandoned. The Asam Kumbang nurseries were upkept at a trifling cost for the purpose of small experiments and of supplying shade and ornamental trees. The nurseries at Pondok Tanjong and Trolak were upkept. In the former, 119,000 seed of rotan sega were sown.

In Selangor, the only nursery upkeep was that at Circular Road, Kuala Lumpur. It now contains seedlings of betis, kemuning and sengkawang. Since improvement fellings in most cases give far better results than does any form of planting, relatively to the cost, the number of nurseries has been allowed to decrease. They are expensive to make and to upkeep, and the results of the planting are uncertain.

PLANTING IN LINES UNDER SHADE IN THE FOREST.

68. This method of forest regeneration has been almost discontinued in favour of improvement fellings. During the year the areas which had already been planted were upkeep, and in many cases improvement fellings were made over the same areas. Seventy-five acres in Trolak and Berang reserves were planted with taban, where the natural forest was not rich in that species. In Pondok Tanjong reserve, 30 acres were planted with tembusu seedlings, between chengal which had been previously planted.

V.—EXPLOITATION.

(a)—*Timber and Fuel.*

(For details, *see* Form 9.)

FROM RESERVED FORESTS.

69. The following were removed from reserved forests:

State.	Reserve.	Timber, tons.	Poles, No.	Firewood, tons.	Free grants, poles.
Perak ...	Bakau Islands ...	...	7,986	40,120 $\frac{1}{2}$	19,900
	" Mainland ...	...	82,901	13,901 $\frac{3}{4}$	...
	Parit ...	...	2,944	...	...
	Pulau Kechil ...	...	7,987	197	...
Selangor ...	Ulu Gombak... ..	57	...	...	...
	Sungei Buloh ...	378 $\frac{1}{2}$	...	...	...
	Bukit Cheraka ...	104	...	...	...
	Islands ...	...	4,589	84,996 $\frac{3}{4}$	...
Negri Sembilan	Banjar ...	17	1,192	32 $\frac{1}{4}$	...
	Senaling ...	213	4,545	...	...
	Sepang ...	...	4,966	530	...
Pahang ...	Kuantan ...	...	...	1,691	...
Total ...		769 $\frac{1}{2}$	117,110	141,469	19,900

These figures show a general increase in the output from reserved forests. The exploitation of reserved forests, other than mangrove, can only be developed slowly owing to the lack of data upon which to base working plans. Such exploitation of timber as is permitted is carried out on safe lines.

It is obviously advisable that, before turning to the forest reserves for timber, the large supplies still remaining on State land should be utilized.

70. An experiment was made in the departmental extraction of firewood at Pulau Kechil, near Port Weld. Malay labour on daily wages, under the supervision of a Forest Guard, was employed to fell and convert nine acres of mangrove forest. The larger trees were converted into firewood and the smaller were sold as poles. The latter was sold by auction, while the firewood was supplied to the S.L. "Ranger" at market rates.

The following is a statement of the expenses and receipts:

	Cost of felling and converting.	Amount realized by sale.
Poles, 7,986 (number) ...	\$231	\$355
Fuel, 197 (tons) ...	425	860
Total ...	\$656	\$1,215

The total profit on the coupe of nine acres was therefore \$559, or \$62 per acre. This area was situated close to Port Weld and was therefore cheap to work in the matter of transport; against this may be set the fact that small areas are relatively more expensive to work than large ones.

FROM STATE AND ALIENATED LAND.

71. The following table shows the timber and fuel removed from unreserved forests, in tons of 50 cubic feet:

State.	Class I.	Class II.	Poles, tons.	Total timber.	Free grant fuel.	Other fuel.	Charcoal.
Perak... ..	52,033	1,824	24,141	77,998	205,533	101,801	7,728
Selangor	20,190	2,304	18,476	40,970	28,821	117,672	6,676
Negri Sembilan	11,748	252	3,512	15,512	18,706	42,331	6,422
Pahang	12,408	82	2,313	14,803	...	12,230	482
Total 1913	96,379	4,462	48,442	149,283	253,060	274,034	21,308
Total 1912	80,832	3,353	36,157	120,778	220,500	225,927	17,601
Total 1911	73,360	3,059	32,208	108,627	270,000	176,167	16,551

This shows an increase of timber and pole volume of 28,505 tons over the output of 1912. Of the 96,379 tons of Class I timber, about 14,100 tons were of Class IA, chiefly chengal, 29,200 tons were of Class IB, chiefly merbau, and 53,000 tons were of Class IC, chiefly meranti of various kinds.

Class II timber is still very little used, except by Malays and by miners under free passes. No figures are available.

The following shows the comparison between the years 1912 and 1913:

	1912.	1913.	Increase.
Class IA	14,000	14,100	100 tons
Class IB	22,600	29,200	6,600 "
Class IC	43,000	53,000	10,000 "

72. The following table shows the comparative output from the four States:

Class of timber.	State.	1912.	1913.	Increase or decrease over 1912.
		Tons.	Tons.	Tons.
Class IA	{ Perak... ..	8,700	7,900	- 800
	{ Selangor	1,400	1,400	...
	{ Negri Sembilan	1,900	2,000	+ 100
	{ Pahang	2,000	2,800	+ 800
Class IB	{ Perak... ..	8,900	12,300	+ 3,300
	{ Selangor	5,100	5,200	+ 100
	{ Negri Sembilan	3,900	4,800	+ 900
	{ Pahang	4,600	6,900	+ 2,300
Class IC	{ Perak... ..	25,000	31,900	+ 6,900
	{ Selangor	12,000	13,500	+ 1,500
	{ Negri Sembilan	4,000	4,900	+ 900
	{ Pahang	2,000	2,700	+ 700

The output of timber Class IA remains, therefore, about the same, for although that in Perak has decreased, that in Pahang has increased by a rather larger amount. That of Class IB timber has greatly increased both in Perak and Pahang; the latter increase is due to the opening up of the Rumpin valley to wood-cutters, from whence large quantities of balau timber have been exported to Singapore. The output of Class IC has increased fairly uniformly over all the States. The demand for building timber for local use was strong throughout all States. The big building programmes of the Railway and Public Works Departments accounted for a large amount of the timber output.

73. The timber trade remains almost entirely in the hands of small Chinese firms. These are extremely conservative in their methods, and also in the matter of the species of trees which they cut. There are two factors which prevent the proper exploitation of the forests on State land. The first is that there has always been such a plentiful supply of a few species, such as chengal and merbau, and the excellent qualities of these are so well known to the public that no other timbers are accepted as being of any value. This is very natural as the durability of chengal and merbau has been proved, and no private person or firm wishes to experiment on other kinds of timber so long as these are available. The consequence is that many valuable trees are left standing in the forests in which wood-cutters are working, or are burnt on the clearing of land. The second factor is that under existing conditions timber-cutters have no security of tenure over the forests in which they are working. Their licences are monthly and they are liable to be turned out at short notice if the land is required for agricultural purposes or for mining. In actual fact the Chinese

wood-cutters have not suffered much from this cause, but it has probably prevented the introduction of modern methods and machinery. There are several saw-mills now working at Telok Anson, converting timber floated from Kuala Kangsar, Kinta, or Batang Padang districts. In the Pahang forests the Chinese still adhere to their old-fashioned and wasteful methods. The Federated Malay States Railway Department have erected a saw-mill at Tembeling in Pahang, which has converted a large amount of planks and scantlings for the construction of quarters along the new line. The fact that the Railway Department are experimenting with various species other than chengal and merbau may have some effect on the trade.

Resak (*Shorea* sp., perhaps *barbata*) has been employed largely in the place of chengal, and appears to be an excellent timber. It is very closely allied to the "Selangan Batu" of Borneo, which is well known in the Singapore market. The trade in balau for the Singapore market has been revived, and giam (*Hopea* sp.) and keranji (*Dialium* sp.) are also utilized to a small extent.

74. The following is a statement of the sleepers extracted in each State for the railway:

State.	Chengal.					
	Class I.	Class II.	Class III.	Crossings.	Rejected.	Total.
Perak ...	43,915	4,772	637	771	138	50,233
Selangor ...	712	42	...	...	2	758
N. Sembilan ...	11,202	2,020	72	94	63	13,451
Pahang ...	8,854	455	280	...	6	9,595
Total ...	64,683	7,289	989	865	209	74,037

State.	Merbau.					
	Class I.	Class II.	Class III.	Crossings.	Rejected.	Total.
Perak ...	51,915	5,807	817	703	179	59,134
Selangor ...	181	20	...	...	...	201
N. Sembilan ...	12,459	1,463	113	80	28	14,143
Pahang ...	85,649	8,784	701	...	311	95,445
Total ...	150,204	16,074	1,631	783	518	168,923

The total for the year is nearly the same as that of 1912, but as regards the sources of supply Perak and Selangor produced less than formerly, which is what might have been expected. Owing to the railway extensions the Pahang output increased. There was a decrease of nearly 25,000 in the number of chengal sleepers cut and an increase of nearly 26,000 in the number of merbau.

The percentage of rejected sleepers was .29 for chengal and .31 for merbau. This is a satisfactory reduction on former years.

75. The outturn of firewood cut by licensees increased by 48,107 tons, which is almost the same increase as that of 1912 over 1911. The difference was distributed as follows :

Perak	...	...	...	...	...	...	+	45,000 tons.
Selangor	...	...	...	...	...	...	-	2,000 "
Negri Sembilan	...	...	...	...	...	...	-	1,000 "
Pahang	...	...	...	...	...	...	+	6,000 "

In Selangor the supply of firewood is rapidly vanishing and almost the whole supply is now coming from reserved forests. The increase in Pahang is attributed to the requirements of the Railway Department, and that in Perak to the fact there is no State forest within a 10-mile radius of many of the large mines and that in consequence these mines cannot get fuel free of charge, but are compelled to buy it in the ordinary way.

76. The firewood removed by miners free of royalty was, as usual, estimated from the figures supplied by the Mines Department of the average horse-power of the engines at work. It is given as :

Perak	...	...	...	...	...	...	...	205,533	tons.
Selangor	...	...	...	...	...	...	...	28,821	"
Negri Sembilan		...	...	...	...	...	...	18,706	"
							Total	...	253,060

In view of the remarks at the end of paragraph 75, these figures should probably be reduced by about 20 per cent., making the total some 200,000 tons. It is at the best only a rough estimate. It is interesting now to recall the origin of the privilege of miners to cut timber and fuel free of royalty. It was granted to them in 1898 in consideration of an increase of \$1 per ball on the opium import duty. For many years the resulting increase in the opium duty was credited to forest revenue. This was discontinued in 1909, and since that year the miners have cut over a million tons of wood without payment, a fact which should be borne in mind when the forest revenue is being analysed.

77. The grand total of all timber, fuel and poles extracted by licensees from all land amounts therefore to 589,603 tons as compared with 563,236 tons in 1912, an increase of 26,367 tons. To this should be added the 200,000 tons of firewood taken by miners free of royalty, giving a total of 789,603 tons.

No figures are available, nor can an estimate be made, of the timber and other produce taken free of royalty by Malays for their own use, or of the timber taken free by miners.

78. Bamboos extracted by licensees are returned as :

Perak	179,746
Selangor	231,229
Negri Sembilan	873
Pahang	21,052
Total	532,900

Almost all the bamboos collected in Negri Sembilan were cut on passes at \$1 each, no record was therefore kept of the amounts.

MINOR PRODUCE.

(a)—*From Reserved Forests.*

79. *Getah taban*.—One thousand and forty-seven dollars were obtained from the sale of gutta-percha collected in Trolak forest reserve by tapping during 1912. The price realized was 3s. 9d. per lb. The cost of collection was 3s. 6½d. per lb., exclusive of the cost of buildings and tools. Thirty-two pikuls of gutta-percha leaves were collected in the same reserve by the Netherlands Gutta-percha Company, but the work was stopped on account of the reckless damage done to the trees by the Chinese labour employed by the Company.

In Rantau Panjang reserve 335 trees (size not stated) were tapped departmentally, but only 69 lbs. of gutta-percha were obtained. The cost, including tools and buildings, was \$558, and that of tapping alone was \$3.28 per lb. This cost is very high and is probably due to entire lack of experience in the work on the part of the tappers.

The question of cost in these experiments is at present a minor consideration. The two points of real importance that require to be decided are (i) the quantity of gutta obtainable by tapping from the trees of various sizes, and (ii) the effect of continual tapping on the trees. Data are being collected with a view of settling these questions. One of the chief difficulties in tapping operations is the impossibility of adequate supervision, owing to the fact that the trees are scattered and the tapping is principally done high up on the stem and on the branches.

The quality of the gutta obtained by tapping is undoubtedly superior to that obtained from the leaves. The value of the latter is impaired by the presence of chlorophyll.

The advantageous sale of gutta is not an easy matter. There is no regular market in London, the requirements of the trade varying greatly from time to time. Whatever the difficulties may be, the production of gutta-percha is a matter that must never be neglected. The supply of wild gutta decreases steadily every year. During last year the quantity that passed through Singapore, which is the gutta market of the world, was very small and that little was much adulterated. The sources of supply are well known and are limited in area, and it is inevitable that the supply of the wild product will eventually fail.

80. A small amount of jelutong rubber was removed from forest reserves by the United Malaysian Manufacturing Company before they ceased working altogether in the forests of the Peninsula. No separate record was kept of the rubber removed from reserved forests; the amount collected from all lands is shown in paragraph 84.

81. Rotans, the royalty on which amounted to \$97, were collected under licence in Tanjong Toalang forest reserve, and 6,629 bundles were removed from Rantau Panjang reserve.

In Negri Sembilan, the Senaling Inas, Bukit Terip, Serting, Triang and Pasoh reserves were worked under licence. Six thousand nine hundred and thirty-five bundles and 29 coils of rotans were removed; the royalty amounted to \$1,797.

82. *Damar*.—A small amount was collected departmentally in Bikam forest reserve. Nine hundred and nineteen pikuls were collected under licence in Senaling Inas, Bukit Terip, Serting, Triang and Pasoh forest reserves in Negri Sembilan.

83. Nipah leaves were collected by a licensee in the Jugra Island forest reserve; royalty amounted to \$20.

(b)—*From Unreserved Forests.*

84. Jelutong rubber was collected by the United Malaysian Manufacturing Company up to the month of November when the fall in the price of rubber compelled them to cease work altogether. The return from all lands was :

		1912. Pikuls.		1913. Pikuls.
Perak ...	...	3,768	...	2,516
Selangor ...	...	2,550	...	873
Negri Sembilan ...	...	63	...	15
Pahang ...	...	16	...	8
Total ...		6,397	...	3,412

The tapping was not good, and many trees have died from the ill-treatment that they received from the coolies employed by this company or by its predecessor, the British Malaysian Manufacturing Company.

85. The damar industry in Negri Sembilan was revived. After the late Mr. da Pra had given up his monopoly of the work in the reserved forests, licences were given to various Chinese to carry on the work. Most of these men had worked under Mr. da Pra as foremen, and already understood the work. The output was greatly increased, and the Deputy Conservator reports that the work has been well done. Little is done in the other States.

		Pikuls.		Torches.
Damar ...	{ Perak ...	...	...	...
	{ Selangor ...	28	...	...
	{ Negri Sembilan ...	2,270	...	23,115
	{ Pahang ...	47	...	171,213
Total ...		2,345	...	194,328

Wood oil (Minyak Keruing)

		Gallons.
Perak ...	...	...
Selangor ...	...	...
Negri Sembilan ...	...	5,334
Pahang ...	...	1,393
Total ...		6,727

86. The output of wild rubber decreased with the fall in prices. In Perak, 26½ pikuls of getah taban leaves were collected by the Netherlands Gutta-percha Company from State land. The output of getah singgirit and getah rambong is given as :

		Pikuls.
Perak ...	...	25
Selangor ...	...	6
Negri Sembilan ...	...	18
Pahang ...	...	196
Total ...		245 as against 466 pikuls in 1912.

87. The output of other minor forest produce, such as mengkuang, bemban, kajang, nipah, nibong, bertam, etc., was about the same as in 1912.

88. It is to be feared that the attempts to revive the native camphor trade in the Rumpin valley have been made too late. It is reported that there are only two men who know the old methods, and the rites and ceremonies by which the camphor was found. Both these men are old and past work. Four katis 8½ tahils were extracted from ten trees in the Gunong Lesong and Mentas reserves and on State land. First quality camphor is valued at \$70 a kati.

89. The outturn of bamboos and canes has slightly increased in quantity.

PART III.

FINANCIAL RESULTS.

(a)—Revenue.

90. The forest revenue collected during the year was \$613,409.63, which is the highest actual forest revenue since the department has been in existence, and this although the rubber sales from Pondok Tanjong plantation were credited to the Department of Agriculture instead of to the Forest Department as in previous years. In 1907 the revenue credited to the department was \$628,313, but of this sum, \$183,060 was the share of the opium duty (*vide* paragraph 76).

The increase over 1912 is \$10,269.62, and that over 1911, the previous record year, \$7,083.35.

91. The following table shows the revenue in each State:

State.	Revenue, 1912.	Estimated, 1913.	Actual, 1913.	Increase over Estimates.
	\$	\$	\$	\$
Perak	337,323	219,100	318,409	99,309
Selangor	145,182	126,000	153,751	27,751
Negri Sembilan	57,535	45,750	64,920	19,170
Pahang	63,100	58,000	76,329	18,329
Total ...	603,140	448,850	613,409	164,559

The increase was general, except under rubber. The revenue from cultivated rubber fell from \$107,782 to \$59,313, due, as has been said, to the Pondok Tanjong plantation revenue being credited to the Agricultural Department. The royalty on wild rubbers fell from \$12,500 to \$5,000, and export duty on wild rubber from \$12,700 to \$5,000.

Under every other head the revenue either increased or remained stationary. The royalty on timber increased from \$153,883 to \$293,049, while the export duty on timber, only collected in Pahang, from \$1,778 to \$6,606.

The decrease in the revenue of Perak has been explained above; if it had not been for the remarkable rise in the royalties in Kinta this decrease would have been even larger.

(b)—Expenditure.

92. The total expenditure for the year was \$364,178 as compared with \$418,847 in 1912, a decrease of \$54,669. The distribution was as follows:

State.	1912.	1913.		Total.	Savings on Estimates.
		Personal Emoluments.	Other Charges.		
	\$	\$	\$	\$	\$
Conservator	27,005	32,772	9,215	41,987	35,419
Perak	157,945	60,466	52,902	113,368	
Selangor	78,985	46,166	42,692	88,858	
Negri Sembilan	54,071	32,139	23,121	55,260	
Pahang	100,841	41,382	23,323	64,705	35,419
Total ...	418,847	212,925	151,253	364,178	
Estimates, Forest Department	...	200,561	172,782	399,597	...
Clerical ... ..	...	26,254	...	...	...

The large increase in the expenditure under personal emoluments, Conservator's office, is due to the fact that the salaries of Federal officers on leave have been shown here instead of under the heading of the State in which they last served.

93. The comparative expenditure was:

	1912.	1913.
Personal Emoluments	\$197,394	\$212,925
Other Charges, Annually Recurrent	199,468	123,626
„ Special	21,985	27,627
Total ...	\$418,847	\$364,178

(a) The increase in personal emoluments was \$15,531, and is due to the appointment of two trained Assistant Conservators to fill the vacancies on the sanctioned staff and also to salary increments.

(b) The decrease in annually recurrent charges is due to the saving consequent on the transfer of the plantations at Pondok Tanjong and Kuala Tembeling to the care of the Department of Agriculture.

(c) The increase in the special expenditure is the result of an increased building programme.

94. The savings on estimates were \$35,419. These were distributed as follows :

(a) Personal Emoluments—Estimated	...	...	...	\$226,815
			Spent	212,925
			Savings	\$ 13,890
(b) Other Charges (Annually Recurrent) Estimated	...	...		\$143,797
			Spent	123,626
			Savings	\$ 20,171

which is accounted for, for the most part, by :

Travelling and Personal (Conservator's vote, \$1,311)	...	...	...	...	\$	2,223
Improvement of Forests	...	...	...	...		2,396
Maintenance of Boundaries	...	...	...	...		1,744
Departmental Extraction of Forest Produce	...	...	...	...		5,455
Launch, Docking and Repairs	...	...	...	...		928
„ Fuel and Stores	...	...	...	...		2,044
(c) Special Expenditure—Estimated	...	...	...	...	\$	28,985
				Spent	...	27,627
				Savings	\$	1,358

which is accounted for by a number of small savings in the votes.

95. Supplementary votes were granted for the following purposes :

Maintenance of Scheme Car, Selangor	...	...	...	...	\$ 65
Contingencies, Negri Sembilan	...	...	...	...	200
Maintenance of Federal Car	...	...	...	...	375
Buildings, Selangor	...	...	...	...	700
Travelling and Personal, Negri Sembilan	...	...	...	...	788
Expenses of Probationer at Oxford...	...	...	...	...	289.29
Rent of Forest Office, Kuantan	...	...	...	...	45
Expenses of Student at Delhra Dun...	...	...	...	...	150

96. The following is a comparative statement of revenue and expenditure :

State.	Revenue, 1913.	Expenditure, 1913.	Surplus.	Deficit.
	\$	\$	\$	\$
Conservator	...	41,987	...	41,987
Perak	318,409	113,368	205,041	...
Selangor	153,751	88,858	64,893	...
Negri Sembilan	64,920	55,260	9,660	...
Pahang	76,329	64,705	11,624	...
Total	613,409	364,178	291,218	41,987

A net surplus of \$249,231 as compared with \$184,293 in 1912. This figure is somewhat abnormal owing to the crediting to revenue during the year of \$48,814 obtained by sale of 1912 rubber from Pondok Tanjong Estate, whereas no expenditure was incurred in this connection.

PART IV.

ADMINISTRATION.

97. The late Mr. A. M. Burn-Murdoch held charge of the department from the beginning of the year until July when ill-health necessitated his taking leave.

Mr. J. P. Mead held charge temporarily, in addition to his own duties as Acting Deputy Conservator of Forests, Selangor, and on the 14th August, Mr. C. Hummel took charge as Acting Conservator. Mr. Hummel held charge until the end of the year.

Owing to ill-health and to the changes in the holders of the office, fewer reserves were inspected by the Conservator of Forests than usual. The following is the record of the inspections:

PERAK.—The offices at Taiping, Tanjong Malim, Telok Anson, Kota Stia, Batu Gajah, Parit Buntar and Parit; forest reserves at Assam Kumbang, Trolak, Berang, Tanjong Toalang, Kledang and many of the mangrove forests.

SELANGOR.—The office at Kajang; forest reserves at Circular Road, Ampang (Water Catchment Area), Sungei Buloh, Bangi, Rantau Panjang, Bukit Badong, Ulu Gombak, Kanching and Bukit Tunggul.

NEGRI SEMBILAN.—The offices at Seremban and Kuala Pilah; the forest reserves at Pasir Panjang, Triang and Bukit Terip.

PAHANG.—The offices at Temerloh, Pekan and Kuantan; the forest reserves at Bukit Goh, Baloh and Kuantan (Mangrove). In all, the Conservator was on tour in the Federated Malay States for 77 days in the year, and in the Colony for 25.

98. In Perak, Mr. B. H. F. Barnard held charge until 18th March, when he handed over to Mr. C. Hummel, and went to Europe on leave. The Deputy Conservator was assisted by Messrs. H. Furnivall, G. J. Henbrey, A. E. Wells and J. P. Mead, Assistant Conservators of Forests, and Mr. V. P. Borges, Extra Assistant Conservator of Forests, and by Messrs. A. M. Askey, G. C. Keun, H. E. de Silva and Tungku Suleiman, Forest Rangers, Grade I.

99. In Selangor, Mr. Hummel held charge until he went to Perak, and Mr. J. P. Mead held charge until the end of the year, assisted by Messrs. H. Furnivall and V. G. Bell, Assistant Conservators, and Messrs. E. R. de Zylva and A. S. Mitchell, Extra Assistant Conservators, and by Mr. V. O'Hara, Forest Ranger, Grade I.

100. In Negri Sembilan, Mr. W. E. Kinsey held charge throughout the year, assisted by Mr. C. A. Clerk, Extra Assistant Conservator, and by Messrs. G. E. Neal and E. P. Godfrey, Forest Rangers, Grade I.

101. In Pahang, Mr. P. Phillips held charge throughout the year, except for four weeks in December when he was on leave and Mr. J. P. Mead carried on his duties in addition to his own. The Deputy Conservator was assisted by Messrs. V. G. Bell, J. G. Watson and J. R. N. Charter, Assistant Conservators of Forests, and by Messrs. F. P. Godfrey, C. A. Speldewinde and R. E. Colomb, Forest Rangers, Grade I.

102. Mr. A. E. Rambaut, Assistant Conservator of Forests, was General Assistant to the Conservator throughout the year.

103. Mr. C. Smith, the Forest Probationer undergoing training in Europe, was expected to arrive in the Federated Malay States in December, but is unable to complete his training before the end of 1914. Mr. J. R. N. Charter, Forest Ranger, Grade I, was appointed Assistant Conservator of Forests from the 1st January, and Mr. J. G. Watson, who has been trained in a Forest School in Germany, was transferred from the Department of Agriculture as Assistant Conservator on the 10th October.

104. The new grade of Extra Assistant Conservator was made on 1st January for the men who have been trained in India, and for Forest Rangers of long service. Messrs. E. R. de Zylva, A. S. Mitchell and C. A. Clerk from the service of the Federated Malay States, and Mr. V. P. Borges from that of the Colony were promoted to the grade, the first three from 1st January, and the last from 21st June. To replace Mr. Borges, Mr. Keun, Forest Ranger, Grade I, was transferred to the Colony. Mr. V. O'Hara's appointment on probation as Forest Ranger, Grade I, was confirmed on 10th February.

105. The following examinations were passed:

Malay, Standard II.—Mr. J. R. N. Charter, Assistant Conservator of Forests.

Law, Senior Officers.—Mr. J. G. Watson, Assistant Conservator of Forests.

Law, Rangers.—Mr. V. O'Hara and Tungku Suleiman, Forest Rangers, Grade I.

106. The subordinate staff was as follows:

State.	Rangers, Grade II.	Rangers, Grade III.	Foresters.	Forest Guards.	Total.
Perak	1	7	10	97	115
Selangor	2	4	7	78	91
Negri Sembilan	3	1	6	60	70
Pahang	2	4	10	44	60
Total ...	8	16	33	279	336

107. The following were the deaths, resignations and dismissals during the year:

State.	Death.	Resignations.	Dismissals.
Perak	1	7	8
Selangor	1	6	2
Negri Sembilan	2	2	2
Pahang	1	3	1
Total ...	5	18	13

The health of the staff seems on the whole to have been better than it was in 1912, but there was much malaria in Negri Sembilan and Pahang.

108. The clerical and miscellaneous staff was:

	Conser- vator.	Perak.	Selangor.	Negri Sembilan.	Pahang.	Total.
Clerks	3	14	16	8	6	47
Collector and Draftsman... ..	1	...	...	...	...	1
Peons and Punkah-pullers	3	12	5	4	6	30
Gardener	1	...	...	...	...	1
Crews of s.l. "Ranger" and motor boat	12	...	...	...	...	12
Malay Clerks and Writers ... ..	...	2	6	1	3	12
Chinese Assistants ... ..	...	1	1	1	1	4
Boatmen ... ..	...	16	...	...	11	27
Demarcators ... ..	...	...	...	1	2	3
Total ...	20	45	28	15	29	137

109. The steam launch "Ranger" was used by the department throughout the year, chiefly at Matang, in the supervision of the mangrove forests. Fuel and stores cost \$1,956, docking and repairs \$1,072. The steam launch "Mina" was used at Port Swettenham for similar purposes, being at the disposal of the department for eight days in every month. The motor boat "Forest Guard" was very useful, but her engines gave much trouble.

110. The botanical collector continued to collect specimens of trees. A list of those identified at Kew will be found in appendix B.

111. Part III of "Trees and Timbers of the Malay Peninsula" was not completed owing to Mr. Burn-Murdoch's illness. The testing of timber in the Conservator's office was carried on, and a list of those specimens tested will be found in appendix C.

B. H. F. BARNARD,
Acting Conservator of Forests F.M.S. and S.S.

APPENDIX A.

COUPES LEASED AND WORKED DURING THE YEAR 1913.

State.	Working Circle.	Coupe.	Area.	Revenue.	Quantity.	Remarks.
		No.	Acres.	\$	Tons.	
Perak	... Kelumpang Island ...	10/13	505	2,030	5,727	Bakau.
Do.	... Selinsing do. ...	10/13	370	2,700	3,785	Do.
Do.	... Sangga do. ...	10/13	515	3,400	8,566	Do.
Do.	... Pasir Itam do. ...	10/13	385	1,250	7,449	Do.
Do.	... Northern Mainland...	5/13	290	1,450	3,417	Do.
Do.	... Central do. ...	5/13	491	3,860	8,654	Do.
Do.	... Southern do. (	4/13	456)	2,500 {	537	Do.
Do.	... Trong Island ...	3/12	456)		543	Do.
Do.	... Sangga do. ...	6/11	1,130	3,000	12,752	Do.
Do.	... Sangga do. ...	9/12	524	1,700	1,645	Do.
Do.	... Central Mainland ...	4/12	100	850	751	Do.
	Total Perak ...	...	...	22,740	53,826	
Selangor	... Banjar ...	16/13	61	78	78	Do.
Do.	... Jugra Island (	1/13	100)	2,551	9,491	Do.
Do.	... Do. ...	3/13	100)			
Do.	... Do. ...	2/13	100	968	3,600	Do.
Do.	... Do. ...	4/13	100	818	3,043	Do.
Do.	... Do. ...	5/13	100	394	534	Do.
Do.	... Klang Island ...	7/13	1,123	17,706	65,869	Do.
	Total Selangor ...	...	...	22,515	82,615	
N. Sembilan	... Sepang ...	5/13	80	629	385	Do.
	Total N. Sembilan...	...	80	629	385	
Pahang	... Kuantan ...	8/13	70	568	1,691	Do.
	Total Pahang ...	...	70	568	1,691	
	Total F.M.S. ...	...	...	46,452	138,517	

APPENDIX B.

List of plant specimens identified at the Gardens, Kew, during the year 1913 :

1. Sinteng	<i>Adenanthera bicolor</i>
2. Mengkudang	<i>Alphonsoa Maingayi</i>
3. Berangan Babi	<i>Castanopsis nephelioides</i>
4. Berangan Betul	„ <i>sumatrana</i>
5. Kelat Merah	<i>Eugenia</i> sp., near <i>Kunstleri</i>
6. Mata Ketam Batu	<i>Gomphia sumatrana</i>
7. Ara Bernteh	<i>Ficus gibbosa</i>
8. Kemuning	<i>Murraya exotica</i>
9. Ludai	<i>Sapium baccatum</i>
10. Kulim	<i>Sorodocarpus borneensis</i>
11. Ampelas Riman	<i>Tetracera sarmentosa</i>

APPENDIX C.

List of timbers tested for transverse strength in Conservator's office during the year 1913:

[illegible]

FEDERATED MALAY STATES.
AREA OF RESERVED FORESTS.—Form 1.

State.	Serial No.	Civil district.	Name of forest reserve.	Area on 1-1-1913.	Area added during year.	Excluded during year.	Area on 31-12-1913.	No. and date of notification.	Remarks.
				Acres.	Acres.	Acres.	Acres.		
Perak ...	1	Larut and Krian	Pondok Tanjong ...	26,496	26,496	...	This reserve was included in the form last year although revoked.
Do. ...	2	Krian ...	Gunong Semanggol	2,778	...	...	2,778	
Do. ...	3	Kuala Kangsar ...	Parit ...	24,044	...	...	24,044	
Do. ...	4	Kinta ...	Kledang ...	3,220	...	...	3,220	
Do. ...	5	Matang ...	Islands ...	65,030	...	...	65,030	
Do. ...	6	Batang Padang ...	Trolak ...	18,085	...	...	18,085	
Do. ...	7	Do. ...	Berang ...	2,164	...	...	2,164	
Do. ...	8	Matang ...	Mainland ...	32,300	...	...	32,300	
Do. ...	9	Kuala Kangsar ...	Plus ...	13,600	...	...	13,600	
Do. ...	10	Larut ...	Asam Kumbang ...	56	...	...	56	
Do. ...	11	Do. ...	Do. ...	53	...	18	35	338 of 31. 1. 13	
Do. ...	12	Kinta ...	Tanjong Toalang...	4,550	...	...	4,550	
Do. ...	13	Batang Padang...	Bikam ...	9,350	...	...	9,350	
Do. ...	14	Lower Perak ...	Changkat Jong ...	9,650	...	...	9,650	
Do. ...	15	Do. ...	Sungei Erong ...	15,500	...	...	15,500	
Do. ...	16	Larut and Kuala Kangsar ...	Larut Hills ...	21,000	21,000		Result of Survey 981 of 11. 4. 13 Result of Survey
Do. ...	17	Batang Padang...	Sungei Kroh ...	10,600	...	200	10,400		
Do. ...	18	Kuala Kangsar ...	Bruas ...	16,355	...	16,355	...		
Do. ...	19	Batang Padang...	G. Besaut...	7,000	...	2,135	4,865		
Do. ...	20	Matang ...	Pulau Kechil ...	93	...	...	93	
Do. ...	21	Lower Perak ...	Telok Baharu ...	1,356	...	...	1,356	
Do. ...	22	Do. ...	Pulau Tiga ...	395	...	...	395	
Do. ...	23	Batang Padang...	Chikus ...	12,500	954	...	13,454	Result of Survey	
Do. ...	24	Lower Perak ...	Rungkup ...	...	10,000	...	10,000	
			Total Perak ...	296,175	10,954	18,708	288,421		
Selangor ...	1	Kuala Lumpur ...	Weld's Hill ...	43	43		Result of Survey
Do. ...	2	Do. ...	Sungei Buloh ...	16,041	164	...	16,205		
Do. ...	3	Do. ...	Circular Road ...	194	...	...	194	
Do. ...	4	Do. ...	Ulu Gombak ...	23,800	...	...	23,800	
Do. ...	5	Do. ...	Ampang * ...	...	7,170	...	7,170	

(Catchment Area,

Selangor	...	1	Kuala Lumpur	...	Weld's Hill	...	43	...	164	...	16,205	Result of Survey	(Catchment Area, Kuala Lumpur Water-supply)
Do.	...	2	Do.	...	Sungei Buloh	...	16,041	...	...	...	194
Do.	...	3	Do.	...	Circular Road	...	194	...	...	...	23,800
Do.	...	4	Do.	...	Ulu Gombak	...	23,800	...	7,170	...	7,170		
Do.	...	5	Do.	...	Ampang *	...	...	...	...	...	...
Do.	...	6	Kuala Lumpur and Ulu Langat	...	Bukit Puteh Prot Belt *	...	8,000	...	3,257	8,000	3,257		
Do.	...	7	Ulu Langat	...	Bukit Sungei Puteh *	...	...	...	...	...	4,500
Do.	...	8	Do.	...	Gunong Hitam	...	4,500	...	...	...	12,965
Do.	...	9	Do.	...	Sungei Lalang	...	12,965	...	...	...	11,239
Do.	...	10	Do.	...	Ayer Hitam	...	11,239	...	...	...	2,338
Do.	...	11	Do.	...	Bangi	...	2,338	...	...	...	1,980
Do.	...	12	Do.	...	Bukit Tunggul	...	1,980	...	3,045	...	3,045		
Do.	...	13	Do.	...	Do. Enggang	...	...	...	...	...	1,150
Do.	...	14	Ulu Selangor	...	Kanching	...	1,150	...	...	...	13,485
Do.	...	15	Do.	...	Bukit Kutu	...	13,485	...	...	...	51
Do.	...	16	Do.	...	Serendah	...	51	...	...	...	2,540
Do.	...	17	Do.	...	Kuang	...	2,540	14,140	...	...	32,100
Do.	...	18	Do.	...	Bukit Belata	...	17,960	...	163	...	23,395		
Do.	...	19	Do.	...	Rantau Panjang	...	23,558	...	...	...	21,233
Do.	...	20	Klang	...	Klang Islands	...	21,233	...	...	...	8,856
Do.	...	21	Klang and Kuala Langat	...	Telok	...	8,856	...	...	...	15,506
Do.	...	22	Klang	...	Pulau Lumut	...	15,506	...	...	...	5,345
Do.	...	23	Do.	...	Jugra	...	5,345	...	...	...	24,265
Do.	...	24	Klang and Kuala Selangor	...	Bukit Cheraka	...	23,826	439	...	...	1,225
Do.	...	25	Kuala Selangor	...	Banjar	...	1,065	8,620	...	...	8,620
Do.	...	25	Kuala Langat	...	Kelambu	...	...	...	...	...	...
Total Selangor							215,675	36,995	8,163	244,507			
Negri Sembilan	...	1	Seremban	...	Senawang	...	1,870	1,870	1300/13	Result of Survey
Do.	...	2	Do.	...	Bukit Terip	...	12,650	...	...	296	12,650
Do.	...	3	Do.	...	Lenggeng	...	3,018	...	...	...	2,722
Do.	...	4	Do.	...	Labu	...	9,000	4,550	...	...	13,550
Do.	...	5	Kuala Pilah	...	Senaling-Inas	...	20,270	...	...	...	20,270
Do.	...	6	Do.	...	Serting	...	3,818	90	...	...	3,908
Do.	...	7	Do.	...	Kopis	...	2,618	3,600	...	...	6,218
Do.	...	8	Do.	...	Pasoh	...	52,800	500	...	...	53,300
Do.	...	9	Do.	...	Pasoh	...	5,615	...	...	...	5,615
Do.	...	10	Tampin	...	Gunong Tampin	...	5,615	...	...	...	11,850
Do.	...	11	Gemas	...	Gemas	...	10,400	1,450	...	...	6,246
Do.	...	12	Do.	...	Tebong	...	3,600	2,646	...	...	24,750
Do.	...	13	Jelebu	...	Triang	...	17,850	6,900	...	...	1,650
Do.	...	14	Coast	...	Sepang	...	1,650	...	...	...	2,960
Do.	...	15	Do.	...	Sendayan	...	1,720	1,240	...	...	1,300
Do.	...	16	Do.	...	Jimah	...	1,300	...	60	...	1,315		
Do.	...	17	Do.	...	Pasir Panjang	...	1,375	...	...	...	55
Do.	...	18	Do.	...	Pasir Puteh	...	55	...	...	...	11
Do.	...	19	Do.	...	Port Dickson	...	11	...	...	...	2,400
Do.	...	19	Do.	...	Sungei Menyala	...	2,400	...	...	...	...
Total N.S.							152,020	20,976	356	172,640			
Pahang	...	1	Lipis	...	Ulu Dong	...	2,853	...	323	...	2,853		
Do.	...	2	Do.	...	Sungei Kerpan	...	...	...	...	...	323
Do.	...	3	Do.	...	Do. Mangsok	...	678	...	...	...	678
Do.	...	4	Do.	...	Do. Puteh	...	2,040	...	...	...	2,040
Do.	...	5	Raub	...	Bilut	...	48,466	...	...	...	48,466
Do.	...	6	Do.	...	Rotan Tunggal	...	1,578	1,695	1,578	...	1,695		
Do.	...	7	Do.	...	Jahit	...	803	...	...	...	803
Do.	...	8	Kuantan	...	Bukit Goh	...	20,600	294	...	...	20,894
Do.	...	9	Do.	...	Baloh	...	5,670	...	...	...	5,670
Do.	...	10	Do.	...	Kampong Padang	...	1	...	...	...	1
Do.	...	11	Do.	...	Mentas	...	1,435	...	...	...	1,435
Do.	...	12	Pekan	...	Perah	...	503	...	...	...	503
Do.	...	13	Do.	...	Riyam	...	1,522	...	...	...	1,522
Do.	...	14	Do.	...	Kuantan	...	1,424	...	...	...	1,424
Do.	...	15	Kuantan	...	Kuantan	...	414	...	...	...	414
Do.	...	16	Do.	...	Sungei Karang	...	414	...	...	...	22,960
Do.	...	17	Raub	...	Pertang	...	22,960	...	...	...	224
Do.	...	18	Kuantan	...	Baloh Mangrove	...	...	224	...	...	224
Do.	...	19	Pekan	...	Bukit Lesong	...	...	108,700	...	...	108,700
Do.	...	19	Do.	...	Pulau Lang	...	...	59	...	...	59
Total Pahang							110,947	111,295	1,578	220,664			
Perak							296,175	10,954	18,708	288,421			
Selangor							215,675	36,995	8,163	244,507			
Negri Sembilan							152,020	20,976	356	172,640			
Pahang							110,947	111,295	1,578	220,664			
Grand Total							774,817	180,220	28,805*	926,232			

* The area shown formerly as Bukit Puteh Protective Belt is now revoked as it forms part of the Ampang and Bukit Sungei Puteh Reserves.

FEDERATED MALAY STATES.

STATEMENT SHOWING PROGRESS MADE IN FORMATION OF NEW RESERVES DURING 1913.—Form 2.

State.	Area already finally gazetted at beginning of year.	Areas finally gazetted during year.			Total area finally gazetted at close of year.	Area proposed, and not yet finally gazetted.		
		Name of reserve.	No. of order in Gazette.	Area in acres.		Name.	Area.	Remarks.
	Acres.				Acres.		Acres.	
Perak	296,175	*(Pondok Tanjong)	982/13	26,496	296,175	Ijok	13,000	Under survey
		Rungkup	3066/13	10,000		Sayong	76,000	Notified under sec. 4
						Kuala Kurau	2,700	Under survey
						Sungai Piah	90,000	Altered
						Bruas	16,335	Surveyed (v. para 1)
						Tanjong Toalang Ext.	3,900	Awaiting survey
						Chior Big Game	10,500	Demarcated
						Padang Chong	3,000	Under demarcation
						Lapang Ninerig	6,000	Do. do
Total Perak ...	296,175	Total Perak ...	...	10,000		Total Perak ...	221,435	
Selangor	215,666				215,666	Klang catchment area		
		Bukit Enggang	3069/13	3,045		Bukit Badong	3,500	Surveyed
		Bukit Sungai Puteh	1692/13	3,257		Jugra Island Extension	3,206	Do.
		Bukit Belata Extension...	876/13	14,140		Bukit Sungei Puteh Ext.	1,330	Do.
		Ampang	3703/13	7,170		Semangko	3,400	Under demarcation
		Subang	3067/13	439		Kuala Kubu catchment		
		Kelambu	3068/13	8,620		area	385	Surveyed
						Kapar	10,200	Under demarcation
						Gunong Hitam Ext. ...	5,000	Do. survey
						Kanching	1,180	Surveyed
						Kajang catchment area	495	
Total Selangor ...	215,666	Total Selangor ...	...	36,671		Total Selangor ...	28,696	
Negri Sembilan ...	152,020	Gemas Extension	2292/13	1,450				
		Triang do.	1138/13	6,900				
		Kopis do.	39/13	3,600				
		Tebong do.	2293/13	2,646				
		Pasoh do.	99/13	500				
		Sendayan do.	1567/13	1,240				
		Labu do.	2594/13	4,550				
Total N. Sembilan ...	152,020	Total N. Sembilan ...	...	20,886				
Pahang	110,947							
		Sungei Kerpan	1304/13	323				
		Raub Catchment Area ...	1303/13	117				
		Kuantan do.	202/13	294				
		Bukit Lesong	2171/13	108,700				
		Baloh Mangrove	4294/13	224				
		Pulau Lang	2780/13	59				
Total Pahang ...	110,947	Total Pahang ...	...	109,717				

* The area of this reserve is included in the area given in column (2).

FEDERATED MALAY STATES.

RECORD OF DEMARCATION AND MAINTENANCE OF BOUNDARIES FOR 1913.—Form 3.

State.	Name of forest reserve.	Length of boundaries artificially demarcated during year.	Length of previously existing boundaries repaired.	Length not repaired.	Total length of artificially marked boundaries at close of year.	Length of natural boundaries not requiring demarcation.	Total length of boundaries.	Expenditure.		Remarks.
								New work.	Repairs.	
		Miles.	Miles.	Miles.	Miles.	Miles.	Miles.	\$	\$	
Perak	All reserves	91	327	51	469	381	850	3,517	1,422	
Selangor	Do.	49	284	44	377	178	555	619	2,220	
Negri Sembilan ...	Do.	...	263	...	263	57	320	...	1,830	
Pahang	Do.	...	172	11	183	133	316	...	1,368	
	Grand Total ...	140	1,046	106	1,292	749	2,041	4,136	6,840	

N.B.—The length of boundaries in each State on 1-1-13 differs in some cases from that shown in the Annual Report for 1912 as existing on 31-12-12. This is due to the fact that the length of the boundaries are corrected as the reserves are surveyed.

Miscellaneous expenses paid from this vote "Boundary Posts, Tools, etc.," Selangor \$590, Negri Sembilan \$107.

FEDERATED MALAY STATES.

STATEMENT OF AREA SURVEYED AND UNDER SURVEY DURING THE YEAR 1913.—Form 4.

State.	Name of reserve.	By Survey Department.				Rough survey by Forest Officers.			
		Previous to 1-1-13.	Completed during year.	Under survey during year.	Cost.	Previous to 1-1-13.	During year. Area or distance in miles.	Cost.	Remarks.
		Acres.	Acres.	Acres.	\$ c.			\$ c.	
Perak	Pulau Tiga	395							
Do.	Sungei Chikus	13,454					24 miles	589 00	New compartments and interior details
Do.	Pondok Tanjong	26,496					30 do.	913 00	New compartments and interior details
Do.	Gunong Semanggol	2,778							
Do.	Mangrove Mainland	32,300	781		586 00				For excision
Do.	Berang	2,164							
Do.	Asam Kumbang	91							
Do.	Sungei Kroh	10,400							
Do.	Bruas	16,355							
Do.	Parit	24,044					9½ do.	234 00	New compartments
Do.	Bikam	9,350					12 do.	175 00	New compartments and interior details
Do.	Trolak	18,085					1 do.	19 00	Interior details
Do.	Gunong Besaut		4,865		2,809 00		5 do.	104 00	
Do.	Changkat Jong	9,650							
Do.	Kledang	3,220							
Do.	Mangrove Islands	65,123							
Do.	Plus	13,600							
Do.	Tanjong Toalang... ..	4,550					4 do.	122 00	New compartments and interior details
Do.	Telok Baharu	1,356							Paid from "Improvement" of Forests
Do.	Berang Extension						7½ do.	223 00	New boundary
Do.	Rungkup						17 do.	315 00	Boundary
Do.	Ijok			9,600			5 do.	242 00	New boundary
Do.	Kurau		2,054		298 00				
Do.	Tanjong Toalang Exten- sion						3 do.	122 00	Exploration rentis
Do.	Kledang						60 do.	1,890 00	Do. do.
Do.	Padang Chong						32 do.	1,006 00	Exploration rentis and connections
Do.	Lapang Ninering						10 do.	379 00	Exploration rentis
							220 miles	6,333 00*	
Selangor	Weld's Hill	43					Miles. Acres.		
Do.	Sungei Buloh	16,205					1½	9 70	Paths
Do.	Circular Road	194					14	66 00	Paths and streams
Do.	Sungei Lalang	12,965					2½	11 30	Paths
Do.	Ayer Hitam	11,239					7	32 00	Paths and streams
Do.	Bangi	2,338							
Do.	Bukit Tunggul	1,980						49	38 60
Do.	Kanching	1,180					4½	23	57 02
Do.	Serendah	51					8½		83 60
Do.	Kuang	2,540							
Do.	Bukit Belata	32,100							
Do.	Rantau Panjang	23,395							
Do.	Klang Island	21,233					3		22 70
Do.	Teluk	8,856					½		83 12
Do.	Lumut Island	15,506							Path and compartment lines
Do.	Jugra Island	8,551							
Do.	Bukit Cheraka	24,265							
Do.	Bukit Sungei Puteh	3,257					5½	47 00	Path and streams
Do.	Bukit Badong						15	152 60	Do. do.
Do.	Bukit Enggang		4,488		2,808 00				
Do.	Bukit Sungei Puteh Ex- tension		3,045		1,905 00		2½	13 00	Access reserve
Do.	Ampang	7,170	1,360		851 00		2	24 15	Demarcation, etc.
Do.	Kuala Kubu Catchment Area	385	New reserves.						
Do.	Kapar			10,200			21	10,200	304 30
Do.	Gunong Hitam						2		61 10
Do.	Bukit Tarek						11½		322 50
Do.	Semangko Gap						1		30 00
Do.	Kelambu						19½		199 80
Do.	Ulu Gombak						6		36 50
Total Selangor		193,453	8,893	10,200	5,564 00				
Negri Sembilan	Senawang... ..	1,872					128	10,272	1,594 99
Do.	Lenggeng	2,722					3 miles	73 40	Path for compartment lines
Do.	Labu	9,000							
Do.	Sendayan	1,623	1,240						
Do.	Jimah	1,326					22 do.	466 85	{ Path for compartment lines
Do.	Pasir Panjang	1,345							
Do.	Sungai Menyala		2,400						
Do.	Pasir Puteh	55							
Do.	Port Dickson	12							
Do.	Sepang	1,651							
Do.	Senaling-Inas		20,035				2 do.	48 40	Internal details
Do.	Kopis	2,618					11 do.	72 30	Paths and compartment lines
Do.	Serting	3,908					6 do.	34 30	Paths and compartment lines
Do.	Pasoh		57,460				4 do.	38 90	Paths and compartment lines
Do.	Triang						7½ do.	226 70	Paths and compartment lines
Do.	Tebong			24,750			½ do.	9 50	For excision
Do.	Gemas						3 do.	77 80	Do.
Total N. Sembilan		26,132	81,135	24,750			10½ do.	317 20	Path for compartment lines
Pahang. Kuantan	Bukit Goh		20,893½		6,758 00		69½ do.	1,365 35	
Do. do.	Mangrove						Miles. Acres.		
Do. Raub	Jahit		1,424		1,165 40		21	209 65	South-west boundary alteration
Do. Lipis	Sungei Mangsok		803		741 30				
Do. do.	Ulu Dong... ..		678		643 70				
Do. Temerloh	Bukit Woh						800	64 12	Interior details and plotting of paths
Do. Raub	Bentong Karak Road						38,500	1,400 54	Completed during year
Do. do.	Bilut						1¼	213 50	Exploration also included in amount spent under survey
Do. Kuantan	Bukit Serudom						1,000	70 30	Interior details and plotting works of improvements 1911-13
Total Pahang			23,798½		9,308 40		6	698 20	Cost includes exploration by Assistant Conservator of Forests and coolies

* Includes payment made from "Working Plans" for survey of compartments and interior details of reserves.

FEDERATED MALAY STATES.

REGISTER OF BREACHES OF FOREST RULES FOR 1913.—Form 7.

State.	Cases pending from 1912.	New cases of the year.		Total new cases.	Total cases.	Disposed of during year.		Cautioned and discharged.	Fines.	Confiscated Property.
		Theft of timber and minor produce.	Other offences.			Convictions.	Acquittals.			
									\$	\$
Perak	297	90	387	387	327	38	22	7,970	4,381
Selangor	88	62	150	150	134	9	7	2,679	128
Negri Sembilan	15	14	29	29	22	2	5	1,643	62
Pahang	75	51	126	126	108	6	12	1,548	129
Grand Total	475	217	692	692	591	55	46	13,840	4,700

FEDERATED MALAY STATES.

AREA OF PLANTATIONS.—Form 8.

State and district.	Name of reserve.	Kind of plantation.	Area in acres.			Receipts and charges of year.		Remarks.
			On 1-1-13.	Added during year.	On 31-12-13.	Receipts.	Charges.	
Perak—		REGULAR PLANTATIONS.				\$	\$	
Krian	Pondok Tanjong ...	Para Rubber Estate	283	Handed over to D. of A. on 1-1-13	51	46,814	214	From 1912 consignments.
Do.	Kurau	Mangrove	72	40	112	...	17	By the Forest Guards.
Matang	Pasir Itam	Do.	52	...	52	10,850	3,742	
Larut	Taiping	Para Rubber	17	...	17	...	...
Do.	Do.	Casuarina	16	...	16	...	282	Upkeep.
Do.	Do.	Do. and Tembusu	4 $\frac{1}{2}$	...	4 $\frac{1}{2}$	...	...
Do.	Do.	Malabera Do.	18	...	18	...	...
Do.	Do.	Do.	8	34	42	...	2,848	
Batang Padang ...	Trolak	Taban						
		Total Perak ...	470 $\frac{1}{2}$	125	312 $\frac{1}{2}$	57,664	7,103	
Selangor—								
Kuala Lumpur ...	Circular Road ...	Casuarina, Gelam, Tembusu, Jambu, Malabera and Para Rubber	164	...	164	...	1,576	Under para. 57 of report.
Do.	Reservoir Area ...	Para Rubber	12	...	12	737	691	
Do.	Sungei Buloh ...	Teak, Chengal and Para	6	6 $\frac{1}{2}$	12 $\frac{1}{2}$	...	658	
Ulu Selangor ...	Serendah	Casuarina, Tembusu and Para	51	...	51	...	276	
Do.	Kuang	Para Rubber	2	...	2	...	78	
Klang	Klang Island ...	Mangrove ... ..	...	29	29	...	204	
		Total Selangor ...	235	35 $\frac{1}{2}$	270 $\frac{1}{2}$	737	3,483	
Negri Sembilan—	...	...	...	...	...	...	...
Pahang—								
Raub	Rotan Tunggal ...	Merbau	4	...	4	...	...
Kuantan	Tanah Puteh ...	Para Rubber	7	...	7	...	...	Transferred to Agricultural Department.
Lipis	Tembeling	Do.	176	...	...	...	...
		Total Pahang ...	187	...	11	...	...
		Perak	470 $\frac{1}{2}$	125	312 $\frac{1}{2}$	57,664	7,103	
		Selangor	235	35 $\frac{1}{2}$	270 $\frac{1}{2}$	737	3,483	
		Pahang	187	...	11	...	...
		Total Regular Plantations ...	892 $\frac{1}{2}$	160 $\frac{1}{2}$	594	58,401	10,586	

			PLANTING IN LINES UNDER SHADE.						
Perak—									
Krian	...	Pondok Tanjong	Chengal, Merbau, Kulim and Kemuning	537	...	537	...	} 491	New Rotan Sega nursery, \$420
Do.	...	Do.	Rotan Sega	33	...	33	...		Sale of Damar *
Batang Padang	...	Bikam	Chengal	1,067	...	1,067	53 *		Upkeep
Do.	...	Do.	Merbau	30	...	30	...		New work cost \$207
Do.	...	Trolak	Taban	121	73	194	...		
Do.	...	Berang	Do.	...	2	2	...	17	
			Total Perak	1,788	75	1,863	53	1,297	
Selangor—									
Kuala Lumpur	...	Weld's Hill	Taban, Merbau, etc.	36	...	36	...	} * ...	Vide works of improvement
Do.	...	Sungei Buloh	Merbau, Penak, etc.	390	...	390	...		
Ulu Selangor	...	Rantau Panjang	Taban	1,362	...	1,362	...		
Ulu Langat	...	Sungei Lalang	Merbau and Chengal	175	...	175	...		
Do.	...	Bangi	Merbau	50	...	50	...		
			Total Selangor	2,013	...	2,013	...	...
Negri Sembilan—									
Seremban	...	Senawang	Chengal, Merbau, etc.	419	...	419	...	702	
Kuala Pilah	...	Senaling Inas	Do.	228	...	228	1,949	886	
Do.	...	Serting	Do.	29	...	29	75	264	
Do.	...	Kopis	Do.	263	...	263	...	313	
			Total Negri Sembilan	939	...	939	2,024	2,165	
Pahang—									
Raub	...	Bilut	Kulim and Chengal	65	...	65	...	50	Alteration in area on Survey
Kuantan	...	Baloh	Chengal	47	...	47	...	6	
Do.	...	Bukit Goh	Do.	7	...	7	...	...
Do.	...	Do.	Rotan Sega	15	...	15	...	...
			Total Pahang	134	...	134	...	56	
			Perak	1,788	75	1,863	53	1,297	
			Selangor	2,013	...	2,013	...	...
			Negri Sembilan	939	...	939	2,024	2,165	
			Pahang	134	...	134	...	56	
			Total Planting under Shade	4,874	75	4,949	2,077	3,518	
Perak—			WORKS OF IMPROVEMENT.						
Larut	...	Waterfall	Aiding of Taban	70	...	70	...	6	All for the 2nd time
Krian	...	Pondok Tanjong	Do. Timber...	1,617	387	2,004	...	1,191	
Batang Padang	...	Trolak	Do. Taban	4,861	835	4,861	1,060	1,349	
Do.	...	Bikam	Do. Timber...	2,046	482	2,528	...	692	
Do.	...	Berang	Do. Taban	2,191	873	2,191	...	1,127	
Do.	...	Gunong Besaut	Do. do.	293	308	601	...	1,057	Do. do.
Lower Perak	...	Pulau Tiga	Do. do.	199	...	199	...	...
Kuala Kangsar	...	Parit	Do. Timber...	234	562	796	...	2,024	
Kinta	...	T. Toalang	Do. do.	160	85	245	96	321	
			Total Perak	11,671	3,532	13,495	1,156	7,767	
			First Treatment	...	1,824	...	...	5,291	
			Second do.	...	1,708	...	...	2,476	

			First Treatment	...	1,824	...	...	5,291	
			Second do.	...	1,708	...	...	2,476	
Selangor—									
Ulu Selangor	...	Rantau Panjang	Aiding of Timber	...	2,772	304	2,772	1,039	All for the 2nd time
Do.	...	Kuang	Do. do.	...	871	344	1,205	757	10 acres the 2nd time
Do.	...	Kanching	Do. do.	...	470	786	1,180	1,531	76 do. do.
Ulu Langat	...	Ayer Hitam	Do. Taban	...	90	...	90	...	
Do.	...	Bangi	Do. Timber	...	2,220	1,419	2,220	1,708	All for the 2nd time
Do.	...	Sungei Lalang	Do. do.	...	1,010	373	1,383	877	
Do.	...	Bukit Tunggul	Do. do.	...	...	278	278	528	
Kuala Lumpur	...	Ulu Gombak	Do. do.	...	300	200	404	206	96 acres the 2nd time
Do.	...	Weld's Hill	Do. do.	...	42	42	42	65	All for the 2nd time
Do.	...	Sungei Buloh	Do. do.	...	840	860	1,192	1,708	508 acres the 2nd time
Do.	...	Circular Road	Thinnings	...	...	(16)	...	134	
Klang	...	Bukit Cheraka	Aiding of Timber	...	579	324	903	800	
Total Selangor					9,194	4,930	11,669	400	9,353
First Treatment					...	2,475	...	...	...
Second do.					...	2,455	...	...	...
Miscellaneous					...	...	...	4	1,497
Total Selangor					...	...	...	404	10,850
Negri Sembilan—									
	...	Senawang	Aiding of Timber	...	89	147	236	296	
	...	Senaling-Inas	Do. do.	...	283	195	478	596	
	...	Kopis	Do. do.	...	243	204	447	481	
	...	Serting	Do. do.	...	100	78	178	245	
	...	Pasoh	Do. do.	...	100	344	444	21	1,107
	...	Triang and Pasoh	...	...	...	...	...	710	
Total Negri Sembilan					815	968	1,783	731	2,725
Miscellaneous					...	...	...	...	39
					...	...	...	...	2,764
Pahang—									
Lipis	...	Ulu Dong	Aiding of Timber	...	1,809	270	2,079	289	
Do.	...	Sungei Kerpan	Do. do.	...	323	...	323	...	
Do.	...	Do. Mangsok	Do. do.	...	560	...	560	...	
Do.	...	Do. Puteh	Do. do.	...	950	...	950	...	
Raub	...	Rotan Tunggal	Do. do.	...	705	250	955	170	
Do.	...	Bilut	Do. do.	...	680	400	1,080	236	
Kuantan	...	Bukit Goh	Do. do.	...	658	493	1,151	395	
Do.	...	Baloh	Do. do.	...	692	236	752	299	176 acres, re-cleared
Pekan	...	Riyam	Do. do.	...	249	200	449	235	
Do.	...	Perah	Do. do.	...	503	...	503	...	
Do.	...	Bukit Lesong	...	...	...	420	420	641	
Total Pahang					7,129	2,269	9,222	...	2,265
First Treatment					...	2,093	...	...	...
Second do.					...	176	...	...	...

TOTAL OF F.M.S.

Perak	...	(New work)	...	11,671	1,824	13,495	1,156	7,767
Do.	...	(Area re-cleared)	...	...	1,708	...	...	...
Selangor	...	(New work)	...	9,194	2,475	11,669	404	10,850
Do.	...	(Area re-cleared)	...	...	2,455	...	...	...
Negri Sembilan	...	(New work)	...	815	968	1,783	731	2,764
Do.	...	(Area re-cleared)	...	...	...	...	...	...
Pahang	...	(New work)	...	7,129	2,093	9,222	...	2,265
Do.	...	(Area re-cleared)	...	...	176	...	...	...
F.M.S.	...	(New work)	...	28,809	7,360	36,169	2,291	23,646
Do.	...	(Area re-cleared)	...	...	4,339	...	...	...
Total				...	11,699	...	...	...

OUTTURN OF TIMBER AND FUEL FOR THE YEAR 1913.—Form 9.

RESERVED FORESTS.

State.	Timber.										Free grant of Timber and Fuel.	Firewood.	Charcoal.	Bamboos.
	Class IA.		Class IB.		Class IC.		Class II.		Poles.	Total Timber.				
	Tons.	C. ft.	Tons.	C. ft.	Tons.	C. ft.	Tons.	C. ft.		Tons.	Tons.	Tons.	Tons.	
Perak ... ..	...	...	...	...	...	...	...	...	101,818	2,036.28	398	54,219 $\frac{1}{4}$		
Selangor	5	43	190	29	342	38	17	13	5,781	672.04	...	85,028 $\frac{3}{4}$		
Negri Sembilan	56	40	6	15	149	14	...	21	9,511	403.01	...	530		
Pahang ... ..	...	...	...	...	...	...	...	...	...	...	...	1,691		
Total Resd. Forests	62	33	196	44	492	02	17	34	117,110	3,111.33	398	141,469		

UNRESERVED FORESTS.

Perak	7,895	20	12,274	05	31,863	46	1,824	02	1,207,049	77,998.22	205,533	101,800 $\frac{3}{4}$	7,728 $\frac{1}{2}$	179,746
Selangor	1,436	41	5,212	41	13,539	27	2,303	47	923,866	40,970.22	28,821	117,672 $\frac{1}{4}$	6,676 $\frac{1}{4}$	231,229
Negri Sembilan	1,970	06	4,843	26	4,933	42	252	28	175,587	15,511.39	18,706	42,330 $\frac{3}{4}$	6,422	873
Pahang	2,834	40	6,913	42	2,660	26	81	45	115,580	14,802.33	...	12,230	481 $\frac{1}{2}$	21,052
Total Unresd. Forests	14,137	07	29,244	14	52,997	41	4,462	22	2,422,082	149,283.16	253,060	274,033 $\frac{3}{4}$	21,308 $\frac{1}{4}$	201,313

FEDERATED MALAY STATES.

SUMMARY OF REVENUE FOR THE YEAR 1913.—Form 11.

Budget heads. Revenue.	Perak.	Selangor.	Negri Sembilan.	Pahang.	Total.
	\$ c.	\$ c.	\$ c.	\$ c.	\$ c.
Timber and other forest pro- duce removed from forests by Government Agency:					
(a) Timber	215 25	8 00	...	...	223 25
(b) Firewood and charcoal ...					
(c) Bamboos and canes ...					
(d) Getah	58,575 41	737 42	...	...	59,312 83
(e) Other produce	195 90	...	...	...	195 90
Total I. ...	58,986 56	745 42	...	...	59,736 98
II.—Timber and other forest pro- duce removed from forests by purchasers and licensees:					
(a) Timber	150,481 19	68,991 93	36,114 18	37,461 67	293,048 97
(b) Firewood and charcoal ...	67,261 41	70,468 66	16,188 61	5,074 31	158,992 99
(c) Bamboos and canes ...	11,331 45	6,446 62	1,850 59	7,223 30	26,851 96
(d) Getah	1,972 01	825 16	199 17	2,011 80	5,008 14
(e) Other produce	1,822 62	1,402 61	4,028 51	4,044 98	11,298 72
Total II. ...	232,868 68	148,134 98	58,381 06	55,816 06	495,200 78
III.—Unclaimed and confiscated timber and forest produce	4,955 03	168 10	81 05	538 49	5,742 67
Total III. ...	4,955 03	168 10	81 05	538 49	5,742 67
IV.—Export duties:					
(a) Timber and fuel ... ..	...	...	...	6,605 66	6,605 66
(b) Getah	1,074 75	885 34	269 06	2,811 70	5,040 85
(c) Other produce	9,336 57	320 57	3,583 20	6,018 70	19,259 04
Total IV. ...	10,411 32	1,205 91	3,852 26	15,436 06	30,905 55
V.—Miscellaneous:					
(a) Compensation and fines ...	3,383 01	824 50	1,013 00	443 00	5,663 51
(b) Reimbursements	128 42	9 50	345 36	110 56	593 84
(c) Other sources	7,664 21	2,662 83	1,247 50	3,984 76	15,559 30
(d) Rent on Forest Buildings	12 00	...	...	...	12 00
Total V. ...	11,187 64	3,496 83	2,605 86	4,538 32	21,828 65
Grand Total ...	318,409 23	153,751 24	64,920 23	76,328 93	613,409 63